Work functioning impairments due to common mental disorders: measurement and prevention in nurses and allied health professionals

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General discussion
The main objectives of this thesis were to develop and evaluate a job-specific instrument to assess work functioning impairments due to common mental disorders (CMDs) in nurses and allied health professionals (research questions 1 to 3) and to develop and evaluate a workers’ health surveillance (WHS) mental module for nurses and allied health professionals (research questions 4 and 5). In this chapter, the main findings are summarized, the methodological strengths and limitations are discussed, and reflections on the main findings are presented. At the end of this chapter, recommendations for future research and practice are provided.

**MAIN FINDINGS**

1) **Aspects of work functioning that can be impaired due to common mental disorders in nurses and allied health professionals**

The systematic review and five focus groups with nurses and allied health professionals and occupational health experts yielded 13 aspects of impaired work functioning, which are regarded assessable by a self-report questionnaire. Overall, these aspects concern impairments in task-related functioning aspects, causing incidents or near-misses, intrapersonal, and interpersonal aspects of work. In the systematic review, half of the aspects found were supported only by narrative evidence, as the association between these aspects and CMDs was not corroborated by quantitative data. The systematic review revealed no study that specifically focused on allied health professionals and work functioning impairments due to CMDs. The findings yielded from the literature review and the focus groups overlapped to a large extent. However, the focus group data provided more details and examples of behavior for all inventoried aspects.

2) **The Nurses Work Functioning Questionnaire: content validity, factorial structure, and internal consistency**

A questionnaire with seven subscales and a total of 50 items called the Nurses’ Work Functioning Questionnaire (NWFQ) was established. The seven subscales are as follows: 1) **Cognitive aspects of task execution and general incidents**, 2) **Impaired decision making**, 3) **Causing incidents at work** (not suitable for allied health professionals), 4) **Avoidance behavior**, 5) **Conflicts and annoyances with colleagues**, 6) **Impaired contact with patients and their family**, and 7) **Lack of energy and motivation**. The factorial structure was developed by explorative factor analysis and corroborated in confirmatory factor analysis. Regarding content validity, all aspects were evaluated as relevant or highly relevant, and the representativeness of the item pool was assessed as highly comprehensive by six experts. Among the seven definitive subscales, internal consistency was good in four subscales (Cronbach’s alphas ranged from 0.81 to 0.94) and acceptable in three subscales (Cronbach’s alphas ranged from 0.70 to 0.78).
3) Clinimetric quality of the NWFQ in terms of reproducibility, construct validity, and the interpretability of change

To determine the reproducibility of the NWFQ, the reliability and the level of agreement were evaluated in 112 nurses and allied health professionals. All subscales showed good reliability with intraclass correlation coefficients (ICC) above 0.70, except for subscale 2, *Impaired decision making*, for which the ICC was too low (ICC = 0.16). For six subscales, the standard error of measurement (SEM) ranged from 3 to 6, which is considered low for a scale range from 0 to 100. However, the SEM for subscale 2 was rather high (SEM = 17). All subscales reached the hypothesized values for good convergent, divergent, and discriminative validity except for subscale 2, which showed good divergent and discriminative validity but did not meet the criterion for good convergent validity. It is concluded that the NWFQ demonstrates good reproducibility and construct validity for six of the seven subscales, which are regarded suitable for future use. Subscale 2, *Impaired decision making*, needs improvement before further use. Regarding the interpretability of change, it is concluded that three subscales exhibit good interpretability of change. Further analyses of the interpretability of change and of the minimal detectable change values are recommended, as the study sample consisted of a low number of subjects who improved in their work functioning during the three-month period. Provisionally, the calculated MIC values can cautiously be used.

4) The effectiveness of a workers’ health surveillance mental module for nurses and allied health professionals

In total, 191 nurses and allied health professionals took part in a WHS mental module, which included a screening for work functioning and mental health problems. In the control group, 188 workers participated at baseline. Workers who were screened as positive in the intervention group were invited for a consultation with the occupational physician. The effectiveness of the WHS mental module was compared to a control group who were not screened or invited to consult with the occupational physician in a randomized controlled trial. In the group of workers that received the WHS mental module (WHS OP-care group), 151 (79%) of the workers were classified as having work functioning impairments and/or mental health complaints compared to 161 (86%) in the control group.

A statistically significant interaction effect was found for study-group*time on help-seeking behavior (p = 0.02), thus the time course of help-seeking behavior differed significantly for the two study groups. In the WHS OP-care group help-seeking remained stable between baseline and three months follow-up, while it decreased for the control group. The difference between the study groups was 13% at three months of follow-up, which was marginal significant (p = 0.09). Towards six months follow-up, help-seeking behavior decreased more steeply in the WHS OP-care group than it did in the control group, resulting in even slightly less help-seeking behavior. However, the difference was not statistically significant (p = 0.14).
Workers who received the WHS mental module showed statistically less work functioning impairments at three and six months of follow-up when compared to the control group \( (p = 0.04) \). At three months of follow-up, 45% of the workers who received the intervention showed at least minimal important improvements in work functioning; this was 30% in the control group \( (p = 0.03) \). At the six-month follow-up, 41% of workers in the WHS OP-care group exhibited improvements representing a change that was minimal or larger; the magnitude of this change in the control group was 28%. This difference was marginal significant \( (p = 0.05) \).

No significant difference in mental health complaints was found between workers who received the WHS mental module and a control group, except for risky drinking behavior. An interaction effect of study-group*time was found for risky drinking behavior \( (p < 0.01) \). The difference between the two study groups in risky drinking behavior was not statistically significant at three months \( (p = 0.08) \) or six months of follow-up \( (p = 0.36) \), but the timeline of drinking behavior differed. At three months of follow-up, the WHS OP-care group showed a slight rise in drinking behavior compared to the control group; however, at the six-month follow-up, the level had dropped below that observed in the control group.

5) Evaluation of the workers' health surveillance mental module in terms of response, compliance, adherence, and perspectives on the WHS mental module

The process evaluation of the WHS mental module revealed that the response rate was 32%. With respect to compliance, 51 (34%) of the 151 workers in the WHS OP-group, who were screened as positive, followed up upon the invitation for the preventive consultation. Due to system errors, only 125 of the 151 workers were invited for a consultation, thus 41% of the invited workers followed up upon the invitation. 80% of these workers reported to have followed the occupational physician’s advice if any had been given. It was found that 13% of the participants in the WHS OP-care group would rather receive their personal results differently in the future. The occupational physicians rated that 70% of the participants who went to the consultation felt that the personal results (partly) reflected their level of work functioning; this value was 60% for the mental health screening results. Moreover, almost all workers who visited the occupational physician for the preventive consultation felt that they could be open and honest with their occupational physician. The preventive consultation was perceived as effective by nine out of 15 participants. Most participants would appreciate to be offered a WHS in the future.

The adherence of the occupational physicians to the consultation protocol was high, as all steps were followed in most cases. The occupational physicians were satisfied with the consultation protocol and training. They felt that the preventive consultations had been meaningful and that implementing a WHS mental module in the future would also be meaningful. The occupational physicians expressed some reluctance and helplessness regarding providing advice and initiating further care in cases when the worker did not recognize the results of the mental health screening. Suggestions were given for improvement
of the present WHS mental module, e.g., regarding the in-house communication strategy and the role of e-mental health interventions.

**METHODOLOGICAL CONSIDERATIONS**

**The development of the NWFQ**

One of the strengths of this thesis is the method applied for the NWFQ development. The development followed a clear step-by-step procedure which was planned in advance. In the development process, findings from the literature as well as qualitative data conveying the knowledge and experiences of employees and experts were used as input. Furthermore, in the quality assessment of possible items and subscales, both expert opinions and statistical analyses were used. In conclusion, the procedure employed exemplifies the requirements for the development of a scientific questionnaire that is relevant for practice according to the psychometric and clinimetric literature. Due to the transparency of this comprehensive strategy, it might function as an example of good practice for the development of scientific questionnaires in the field of occupational health.

The underlying construct of the NWFQ is impaired work functioning due to CMDs in nurses and allied health professionals. Therefore, in the formulation of items, the focus was placed strongly on aspects of work functioning that are signs of impairment. As a result, items were often formulated negatively, in the sense that they present examples of undesirable behavior. This structure is similar to health complaint scales, where items mostly present symptoms of health complaints, and also similar to some existing work functioning questionnaires, such as the Work Limitation Questionnaire (WLQ). On these types of items, the majority of workers will report no impairments because they are healthy and well-functioning and thus, will have a score of zero or slightly above. Two consequences of this characteristic of the NWFQ scores are considered. The first consequence is a non-normal distribution of NWFQ scores when applying the questionnaire in a nursing population comprising mainly healthy and well-functioning workers. The second consequence is that no gradation for good work functioning can be assessed using the NWFQ nor can any improvements in work functioning over time among workers who already function well. Therefore, the NWFQ is restricted in its usefulness, e.g., for the human resource management setting. When applying the NWFQ for evaluative purposes in research, these consequences must be considered; however, for detection purposes, as in the context of WHS, they are not expected to have a negative impact.

**Case classification by the NWFQ**

Due to the absence of a gold standard, the cut-off values for the WHS screening were based on statistical norms, according to the principle that sum scores can lead to three categories:
green, orange, and red. Therefore, two cut-off values were set per subscale based on the percentiles in a population with mild mental health complaints. For the total NWFQ, a red score on one subscale or three or more orange scores led to case identification for impaired work functioning. The method applied is rather arbitrary, but it is common for questionnaires measuring fairly new constructs, for which a gold standard or any other reference standard is nonexistent. One example is the Maslach Burnout Inventory, a widely used self-report questionnaire for the measurement and diagnosis of burnout. For the Dutch version, the Utrecht Burnout Scale, cut-off values were initially based on percentiles. Additional studies for clinically derived cut-off values were recommended by the same authors, which were published in 2001, six years after the questionnaire was first published.

Likewise, further validation of the cut-off values of the NWFQ is necessary. However, the absence of a gold or a reference standard makes a number of regular procedures impossible. According to Rutjes and colleagues, other types of evaluation must be considered in cases where no single reference standard or set of tests for classification exists. One solution might be the use of research methods that were originally developed for other purposes. A method analogous to the anchor-based method for minimal important change value identification might be interesting in this context. Anchor scores could be used to assess whether the work functioning of a workers is perceived as sufficient or impaired. These anchor scores could then be used as a reference standard to evaluate the existing cut-off points using the ROC-curve method or to identify new cut-off points. However, anchor formulation and selection of the right group to fill out the anchor questions represent substantial challenges. Another conceivable option with which to evaluate or identify new cut-off values would involve use of the Delphi method.

For future use of the NWFQ, I assume that the previously identified cut-off values might be sufficient for research purposes, e.g., the dichotomization of data. For screening purposes, they should, however, only be used in combination with a second-stage screening, such as a consultation with an occupational physician or another occupational health professional, e.g., an occupational health nurse, psychologist, social worker, or occupational therapist, depending on the occupational health system of the specific country or company.

### Screening strategy for the workers’ health surveillance mental module

The screening strategy applied in the WHS mental module led to a high number of positives among the workers screened: 79% in the WHS OP-care group and 86% in the control group. Methodological and theoretical choices for the screening may have influenced this high percentage. First, the applied cut-off values, which were all validated except for the NWFQ (as discussed above), influenced these percentages. For the WHS mental module, cut-off values were selected with a choice for optimal sensitivity but at the cost of specificity. With an eye toward prevention, it was desired not to miss the chance to offer workers the opportunity for a preventive consultation with the occupational physician. Second, the screening results were
supposed to be as detailed as possible to allow for optimal feedback and, therefore, purposeful interventions by the occupational physician. Therefore, it was our intention to separately screen for common mental health problems which can be related to the work of healthcare workers. Also, the various aspects of work functioning impairment were screened for separately. This resulted in the use of six screeners for mental health complaints, and seven aspects of work functioning impairment that were investigated separately. The use of thirteen different screening instruments must have influenced the overall percentage of positive screened workers.

The question rises as to whether the right group of workers was identified. Not all workers who were screened as positive can be seen as workers with CMDs or serious work functioning problems. However, all of these workers had reported symptoms of either work functioning impairments or a mental health complaint, which were at least classifiable as mild to moderate severe symptoms. Therefore, the individuals labeled as positive represent a group of workers in which the improvement of work functioning and/or mental health should be possible.

Nevertheless, possible harms of the applied screening strategy should be considered. The screening method applied was regarded as safe for two reasons. First, the personal feedback on screening results that was provided online was formulated mildly without speaking of health problems or diagnosis to prevent any wrong interpretations or premature conclusions. Second, the consultation with the occupational physician was regarded as a second screening-stage; no treatment had been initiated before the visit to the occupational physician (or any other caregiver). Only a few notifications were received from supervisors and workers who were upset by the personal results. This was mainly related to the risky drinking behavior scale. However, as part of the process evaluation, the occupational physicians reported that for 70% of the workers who came to the preventive consultation, screening results (partially) reflected their perceived work functioning, and in 60% of the workers, screening results (partially) reflected their mental health state (Ketelaar et al., submitted). This should be regarded as satisfactory, as difficulties with recognizing mental health complaints discovered through a screening is not uncommon. Furthermore, among the workers who followed the invitation for the occupational physician consultation, 85% were content with the advice they received on improving work functioning and/or mental health.

In future improvements of the WHS mental module, the choice for cut-off values and for the feedback strategy should be reevaluated to further reduce any possible harm. One option is to apply cut-off values with high sensitivity but low specificity; however, in this case, personal screening results should be presented in a safer and more personal environment, e.g., by the occupational physician or an occupational health nurse. Another option is to present the results of the screening online, as was done in this study. In such a case, it would be necessary to apply less sensitive cut-off values to even more purposively avoid the negative effects of feedback in false-positive cases. This second strategy would be preferable in light of
the process evaluation, which showed that employees prefer online feedback to receiving personal feedback from an occupational physician (Ketelaar et al., submitted).

**INTERPRETATION OF AND REFLECTION ON THE MAIN FINDINGS**

**The additional value of the NWFQ**

In the introduction of this thesis, the need for more insight into job-specific aspects of work functioning impairments due to CMDs was formulated, as well as the necessity for a work functioning questionnaire that operationalizes impaired work functioning due to CMDs in nurses and allied health professionals. These aims were achieved successfully in the first four studies of this thesis. The conceptual model of work functioning described in the General introduction (Chapter 1), was initially designed as a tool to support the development process of the questionnaire. As could be expected, the subscales identified for the NWFQ represent all parts of work functioning as defined in the conceptual model, which were task and contextual elements, as well as the four following dimensions: process, quality outcomes, quantity outcomes, and effort. It has to be noted, that the conceptual model was designed with the development of a questionnaire for impaired work functioning of hospital workers in mind. Thus, before applying the model for other aims, it should be reevaluated and possibly adapted for the specific purpose.

It is concluded that the NWFQ is of additional value compared to existing generic work functioning questionnaires. The first feature in which the NWFQ differs is that it examines aspects of work functioning that are not, or are to a lesser extent, included in generic work functioning instruments. One of these aspects is causing incidents at work, an important risk of working in healthcare. The other aspect is interpersonal behavior, which in the NWFQ is separately measured for contact with colleagues and for communication with patients and their family. The second feature that exemplifies the added value of the job-specific questionnaire is the formulation of its items, which mainly presents concrete examples of behaviors and tasks. I assume that therefore less interpretation of the items investigated is necessary, and reflection on one’s own behavior is facilitated; both benefits promote the accuracy of the self-report measure.

**The scope of application of the NWFQ**

The NWFQ is innovative because it measures work functioning impairments that are both disease- and job-specific. This specific approach might influence the scope of application of the questionnaire. In the following text, I will reflect on the applicability of the NWFQ within the context of WHS, within occupational health practice for purposes other than WHS, and for research purposes.
Use of the NWFQ in workers’ health surveillance

The NWFQ encompasses various signs for impaired work functioning, which makes the questionnaire advantageous for both screening and the intervention in a WHS. For screening purposes, it allows for the classification of workers who demonstrated impaired work functioning during a certain period compared to other periods in their careers. However, in the future, cut-off points should be further validated to reduce the risk of misclassification.

With regard to the intervention element in workers’ health surveillance, NWFQ scores provide a good starting point for the occupational physician to select interventions that can be discussed with the worker. The multidimensionality and the concrete examples of work behaviors and tasks that are reflected in the items provide detailed insight into the exact aspects of work that are presumably impaired. This insight offers input on work aspects that might be necessary to adapt in favor of the health and safety of the workers and their patients. To reduce short-term risks for health and safety, temporary changes in the work content, work organization (e.g., working with or without a colleague on specific tasks), type of shifts, or number of work hours might be appropriate. Over the long run, one should focus on the adaptation of the workers’ perception, work methods, and work conditions. As a positive effect was found for the WHS mental module on work functioning impairments, it can be assumed that the NWFQ scores as part of the screening results do indeed contribute to those adaptations.

Use of the NWFQ in occupational health care

Use of the NWFQ in occupational health practice, outside of the WHS setting, remains to be investigated. It would be interesting to further investigate the value of the NWFQ for evaluative purposes in counseling by occupational physicians, e.g., of nurses who return to work after a period of sickness absence. Workers who return to work after sickness absence spells due to CMDs are often not fully recovered. Therefore, impairments in work functioning are still an issue after work resumption. For this group of workers, detailed insight into work functioning impairments may be useful to prevent risks for themselves and for the patient. The results of the NWFQ, e.g., filled out online on a regular basis, might be of value for the identification of difficulties in the work exertion and for insights into which aspects of work might need further attention and guidance. To interpret changes in work functioning over time, MIC values of the NWFQ may be an indication of important improvements.

Use of the NWFQ in research

With a shift in focus from absenteeism to work functioning (presenteeism) in the occupational health research during the last decade, work functioning is used more often as an outcome measure in observational and interventional studies. The NWFQ provides a suitable measure for these aims in studies on nurses and allied health professionals. However, the application range for research purposes might be reduced because the NWFQ operationalizes impaired
work functioning, and consequently, it does not assess differences in the functioning of workers who have no or only small impairments. Application of the questionnaire in a population with mainly healthy and well-functioning workers therefore is not sensible, except for screening purposes. Furthermore, as mentioned above, the NWFQ scores do not follow a normal distribution in the general population of nurses and allied health professionals. Therefore, NWFQ scores need to be adapted by log-transformation, which, however, reduces the ease of interpretability of results. Alternately, non-parametric analyses could be performed, which, however, result in a decrease in power.

Not all scientific studies have the scope to evaluate multiple aspects of impaired work functioning separately. Using the total score of the NWFQ might be a good alternative when insight into the separate subscales is not possible or relevant. In post-hoc analyses, we calculated the intraclass correlation coefficient of the total NWFQ score (without the impaired decision making subscale) and found it to be above 0.90, a value that met the criterion for good reliability. Thus, the reliability of the NWFQ total score is regarded as good.

The NWFQ: a template for further work functioning questionnaires?
The studies on the NWFQ might function as a template for the development of work functioning instruments for other occupations. For occupations with a high prevalence of CMDs, in which work functioning impairments are associated with risks for the health and safety of the worker and the safety and well-being of others, comparable questionnaires might be relevant. This is the case for healthcare workers other than nurses and allied health professionals, such as doctors or care-givers outside the hospital setting, but also for human service workers such as teachers, social workers, and emergency responders, e.g., firefighters, ambulance workers, and police staff.12

For other occupations in the healthcare sector, it might be sufficient to adapt the NWFQ by making small adjustments to certain items to better reflect the daily work of the specific occupational group. For occupations outside of healthcare service, the methods section of Chapter 3 of this thesis provides an example of good practice for the scientific development of a job-specific and health-related work functioning questionnaire. However, the applied approach is comprehensive and time consuming and may therefore not always be feasible. The systematic literature review yielded no themes of impaired work functioning due to CMDs that were not also mentioned during the focus groups. Additionally, the focus group interviews gave more detailed insight into the exact tasks and behaviors that are impaired. Therefore, for a less time-consuming development process, it is advisable to combine a quick literature search with thorough qualitative data gathering (through the use of semi-structured in-depth interviews or focus group interviews).

The subscales that are regarded as adaptable to most jobs in the human service sector concern the following aspects: cognitive aspects of work; impaired decision making; avoidance behavior; contact and communication with co-workers, as well as with other
persons (e.g., pupils and parents for teachers and the public for police officers); and lack of energy and motivation. The subscale *Causing incidents at work* is regarded as crucial for most occupations that have responsibilities for the safety and well-being of others; however, it was difficult to apply this subscale to the evaluation of occupational groups for which reporting incidents is less common (allied health professionals). One alternative would be to omit the words “incidents” and “near-misses” and instead describe concrete adverse events specific to an occupational group. In such a questionnaire, e.g., for police officers, this could mean the failure to act immediately upon a situation or to judge the seriousness of a situation incorrectly.

**The effectiveness of the workers’ health surveillance mental module**

The WHS mental module developed and evaluated as part of this thesis aimed to stimulate help-seeking behavior in workers with work functioning impairments and/or mental health complaints. An increase in the number of workers who have visited a caregiver was observed. Although, help seeking increased only by following the invitation for the preventive consultation with the occupational physician, not for other type of caregivers. An underlying presumption was that providing feedback on screening results would enhance help-seeking behavior, due to an increase of recognition of mental health complaints and impairments in work functioning. However, effects on the recognition of complaints were not measured directly. Knowledge of the possible effects on recognition would be useful, as it could provide further insight into the stimulating effect on self-reflection by the feedback of screening results or by the preventive consultation with the occupational physician.

Furthermore, for this WHS mental module, the underlying assumption was that in consultation with the occupational physician (or any other caregiver) self-evidently interventions would be initiated. This would in turn lead to an improvement in work functioning and a reduction of mental health complaints. However, effects were only found on work functioning and on risky drinking behavior.

A decrease in work functioning impairments was observed among the group of workers to which the WHS mental module was offered. This effect on work functioning is promising, especially when considering that only 41% of the 125 positively screened workers who received an invitation to consult with their occupational physician accepted the invitation. Although the effect of the WHS mental module on the improvement of work functioning is promising, still, little insight has been gained into what establishes this effect. It might be based on the personal feedback, the consultation with the occupational physician, or its interplay, as well as on work adaptations or changes in behavior initiated by the worker him- or herself. Furthermore, as a total score for work functioning was used as outcome measure, no effects for the various different aspects of work functioning have been investigated. Future
research should focus on understanding the sources of the effect on work functioning. With this insight, the protocol for the preventive consultation could be improved.

No effects of the intervention were found on the measured mental health complaints, other than risky drinking behavior. Risky drinking behavior as measured in the effect study of the WHS mental module might be regarded as a behavioral outcome rather than a mental health complaint. Therefore, it might be concluded that the WHS mental module has an effect on behavioral changes, i.e., work functioning and risky drinking behavior, whereas not on the mental health state. The process evaluation of the WHS mental module showed that the participating occupational physicians doubted the quality of the screeners and cut-off points used in the study to some extent, particularly those regarding risky drinking behavior. However, the screening results regarding risky drinking behavior were extensively discussed in most preventive consultations, although without providing advice for the regulation of alcohol consumption. Therefore, it might be assumed that the attention given to risky drinking, even without providing advice, had an effect on this behavior.

One possible explanation for the absence of a reduction in mental health complaints might be a lack of readiness to offer preventive treatment for mental health complaints on the part of the occupational physicians, when confronted with workers who did not perceive a mental health problem. A focus group was held with the participating occupational physicians as part of the process evaluation (Chapter 8). The occupational physicians expressed reluctance and helplessness regarding providing advice and initiating further care in cases when the worker did not recognize the results of the mental health screening. The process evaluation also showed that only a limited number of workers were scheduled for follow-up appointments with the occupational physician. Reluctance on the part of primary care providers with regard to providing brief interventions for preventive purposes is not uncommon, as a study on alcohol use screening and a subsequent brief intervention by general practitioners showed. Issues such as the caregivers’ own perception of screening and the stigma related to the screened complaints are some of the factors underlying this reluctance. Other reasons for reluctance reported included concerns about the relationship with the client and the doctors’ understanding of their work as being primarily treatment rather than prevention.

To stimulate more proactive preventive guidance, the training for the WHS mental module administered to occupational physicians should more strongly emphasize that, for preventive purposes, mild health complaints do not necessarily need to be fully recognized or associated with serious burden. Instead, the starting point for prevention should be that mild mental health complaints might easily deteriorate in the (near) future, with consequent risks for the well-being, health, and safety of the worker and his or her patients. This message should be the basis for the discussion of screening results with the worker and for the initiation of advises the occupational physician provides. The training should also include the discussion of any expected barriers to the initiation of more intensive advising as part of prevention.
In addition to the need for more proactive guidance of the group of workers with mild or moderate severe complaints, more proactive guidance by the occupational physicians for a small selected group of workers with more severe mental health complaints is regarded as necessary. In previous studies where screening and intervention were combined to improve work outcomes and the mental health states of depressive workers, considerable effects on depressive symptoms and work functioning were observed. In all three studies, screening targeted more severe mental health complaints and the treatment offered was much more intensive, in contrast to the WHS mental module studied. Therefore, for this group of workers, the occupational physician should organize more intensive counseling by referral to specialized mental health caregivers, such as psychologists and welfare workers. Referral to an employee assistance program might also be useful, if these are included in the national or company occupational health care program, as is the case in the United Kingdom, Japan, and the United States. The process evaluation showed that ten workers were referred to other caregivers; however, no increase in use of those care-givers is found at three months of follow-up. Thus, it can be questioned whether the care was actually set-up by the workers. For that reason, after referral, the occupational physician should follow-up on these workers to verify that the needed help has been scheduled and to provide possible guidance for more work-related regulations.

With more proactive effort during the preventive consultation, the worker’s mental health and work functioning might be enhanced. Nevertheless, regarding the absence of a positive effect on mental health complaints, one must keep in mind that the causes of mental health complaints may be situated in the work environment. The improvement of (mild) mental health complaints by interventions targeting the individual might be difficult as long as high job-demands and unfavorable work environment characteristics remain unchanged.

In conclusion, the WHS mental module is a successful strategy in stimulating seeking help from the occupational physician. Regarding the aims of the WHS formulated by the Netherlands Society of Occupational Medicine, we can conclude that the WHS mental module studied here does monitor and improve work functioning. However, the goals of monitoring and improving mental health were not sufficiently met by the studied WHS mental module during the six-months follow-up period.

**RECOMMENDATIONS**

**Improvement of the workers’ health surveillance mental module**

**Screening**

- It is recommended to tune the selection of cut-off values to the feedback strategy for the individuals’ screening results. When providing feedback personally by the occupational
physicians, a decision to aim for high sensitivity but low specificity is tolerable. When choosing to present personal screening results online, cut-off values with higher specificity and lower sensitivity should be chosen.

**Preventive consultation with the occupational physicians**
- It is suggested to improve the method of invitation to the preventive consultation. As workers prefer to make appointments themselves, this change in strategy might reduce reluctance in workers to attend the preventive consultation.
- It is advised to better train the occupational physicians for the preventive context. Aspects that should be more intensively discussed in their training include communication with workers with mild mental health complaints rather than an expressed need for help.

**Future research**

**Further evaluation of the NWFQ**
- The clinimetric quality of subscale 2), *Impaired decision making*, was too poor to recommend further use of this subscale in the present form. Impaired decision making is still regarded as an important aspect of the construct of the NWFQ. Future studies should improve the current items and response categories or identify suitable new items, to yield a reproducible and valid form of this subscale that can be included in the NWFQ.
- Cut-off values of the NWFQ should be further developed. A method analogous to the anchor-based method for the MIC-value identification or a Delphi consensus study might be suitable to identify cut-off values for the NWFQ.
- The NWFQ was developed and evaluated in the Dutch language. Backward-forward translations of the questionnaire exist in English and in Italian. Future research should evaluate the clinimetric quality of these versions.
- Future studies should evaluate the validity of the NWFQ for related occupational groups such as caregivers outside the hospital or physicians.

**Future research on workers' health surveillance mental modules**
- The effect of providing feedback on screening results and of the preventive consultation with the occupational physician on the recognition of mental health complaints should be further investigated.
- More insight is needed into the advice provided by occupational physicians to address impaired work functioning as well as into the actions workers initiate to improve their work functioning. With more transparency in terms of the advice given and followed, the preventive consultation protocol could be improved, which might lead to an increased effect on work functioning.
Implications for practice

**Policy makers**
- The work functioning impairments in nurses and allied health professionals due to CMDs are associated with risks for the patient’s well-being, health, and safety. Policy makers in medical centers should be aware of these risks. Making use of a WHS mental module or similar strategies, such as employee assistance programs, can help reduce work functioning impairments due to CMDs in this group.

**Occupational health professionals**
- Actions to further develop and evaluate WHS mental modules, within the healthcare service as well as in other sectors, should be initiated.
- If workers are noted to have mental health problems, although mild, occupational health professionals should always discuss possible consequences with regard to work functioning, as well as the risk for deterioration of mental health complaints in the (near) future.
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